LA COSTA AVENUE

TRAFFIC CALMING IMPLEMENTATION STRATEGY

CITY OF CARLSBAD
INCORPORATED 1952
CALIFORNIA

PREPARED BY:

KOA CORPORATION
PLANNING & ENGINEERING

LA COSTA AVENUE

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FINAL REPORT | DECEMBER 2009

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LA COSTA AVENUE

TRAFFIC CALMING IMPLEMENTATION STRATEGY

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CHAPTER 1

THE PROJECT

PROJECT HISTORY

The City of Carlsbad recognizes concerns expressed by the community over speeding and traffic safety along La Costa Avenue between El Camino Real to Rancho Santa Fe Road. Therefore, the City commissioned KOA Corporation to prepare an evaluation of traffic calming opportunities for La Costa Avenue. The evaluation has consisted of two phases of work. The first phase included an evaluation of a "road diet" for La Costa Avenue.

Phase I

The Phase I evaluation provided a comprehensive look at an implementation of a road diet to La Costa Avenue and the effects to the traffic circulation, safety benefits potential, and other effects. As the name suggests, a road diet is the reduction in a roadway either in width or lanes and the balance of that with other potential uses of the corridor. Typically a road diet is the conversion of a four-lane roadway that may or may not have parking, by reducing the four lanes to two lanes and the addition of parking and/or bike lanes, installing medians, or widening of sidewalks and providing safety and speed reduction benefits.

Recent trends in the traffic engineering industry are for the evaluation of existing roadways to include more traffic calming measures and other enhancements to improve walk-ability, reduce speeds and increase safety. The efficient movement of vehicles along a transportation network is vital for a community, and there are substantial efforts involved with providing solutions to reduce roadway congestion. These efforts can include adding lanes, widening roadways and adjusting traffic signal timing. Simultaneously, communities and neighborhoods are looking for more ways to promote more pedestrian and bicycle use as well as slow traffic and provide for a more "livable", "walk-able" and safe environment. Consequently, these guiding principles are sometimes at odds with one another and therefore a balance is necessary to satisfy the needs of the community.

La Costa Avenue

The results of the Phase 1 evaluation showed that based on the City of Carlsbad standards for roadway capacity and level of service that the implementation of a road diet was not recommended since the potential impacts would be significanct. Therefore, the second phase of this project includes the development of a strategy to implement alternative traffic calming measures along La Costa Avenue.

Phase II

Since a road diet and the traffic calming effects were not recommended in Phase I, the City requested alternative traffic

calming measures to be reviewed and recommended. This Phase II evaluation included utilizing traffic calming guidelines from the City's Traffic Management Handbook as well as general principles for arterial traffic calming. The Phase II work developed a set of strategies for arterial road traffic calming along La Costa Avenue as well as considering mobility, safety, traffic operations and feasibility. This report will show the traffic calming concepts and ultimately cost estimates for the potential improvements.

La Costa Avenue and the City's Experience

Over the past twenty years, numerous changes have been made to La Costa Avenue. The roadway was re-striped and traffic signals have been installed at three locations. The City also continues to provide regular police enforcement and monitoring. Larger, additional speed limit signs have been posted along the corridor and speed pavement legends (45 mph) have been painted and red curb installed at locations where sight distance has been a concern.

La Costa Avenue is shown within the City of Carlsbad's Circulation Element as a secondary arterial roadway, which is intended to carry large amount of commuter traffic, fed by other local roads and regional connections. Arterial roadways typically have limited direct access to residential and other private frontage to reduce the conflicting turning movements in and out of driveways and maintain the vehicular throughput of the arterial roadway. However, homes do exist along this corridor and the neighborhood character is challenged by the function of the road.

Although the City has continued their monitoring and enforcement efforts along La Costa Avenue, the community is still interested in other solutions to their concerns and therefore this evaluation has been commissioned.

PROJECT GOALS

This phase conceptualizes traffic calming, circulation, and aesthetic improvements to La Costa Avenue and focuses on creating opportunities for slowing vehicular speeds and including pedestrian enhancements around the neighborhood. The primary goals include:

- Moderating vehicle speeds
- Promoting pedestrian and bicycle access
- Enhancing neighborhood appearance

EVALUATION PROCESS OVERVIEW

As the evaluation was developed, close coordination with the City as well as the local advisory committee was done. Meetings were held with the local committee to describe the Phase I results as well as discuss potential concepts developed from the Phase II work. Once initial traffic calming concepts were developed, a meeting was held to discuss and gather feedback. Then a draft and final report was prepared that incorporated the community's feedback. A number of concepts were developed and reviewed by the City and citizen committee members.

STUDY AREA

The study area for this project includes La Costa Avenue from El Camino Real to Rancho Santa Fe Road. The traffic calming concepts include work along La Costa Avenue with proposed improvements at the intersections. The study area is shown in Figure 1.

The study area considered both existing conditions as well as some planned changes along the La Costa corridor. Specifically, four future traffic signals have been planned at the intersections of:

- Levante Street
- Gibraltar Street
- Esfera Street
- Nueva Castilla Way

Figure 1 | La Costa Avenue Study Area

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CHAPTER 2

TRAFFIC CALMING CONCEPTS

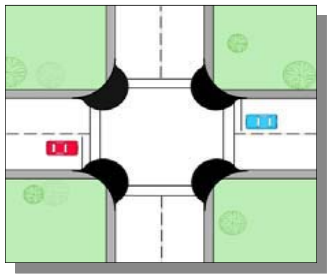
CONCEPT DEVELOPMENT

Traffic calming is defined by the Institute of Traffic Engineers as "the combination of mainly physical measures to reduce the negative effects of motor vehicle use, alter driver behavior, and improve conditions for non-motorized street users." Generally speaking, traffic calming includes the modifications to the roadway which would cause motorists to pay increased attention to driving and therefore decrease driving speed. Research has shown that traffic calming measures do result in reduced speeds, reduced collision severity, reduced need for extraordinary law enforcement, improved safety for pedestrians and bicyclists, and improved access for all modes of traffic.

La Costa Avenue was reviewed for opportunities to implement a wide range of traffic calming measures. Using the City of Carlsbad's Residential Traffic Management Program as a guide as well as current state of the practice when it comes to arterial traffic calming, a set of traffic calming concepts were developed for La Costa Avenue. Since La Costa Avenue is classified by the City as a Secondary Arterial Roadway, many traffic calming measures that may be appropriate for neighborhoods are not applicable to La Costa Avenue. Generally speaking, traffic calming for arterial roadways is best suited for passive speed reduction measures rather than measures that may divert traffic to other roadways or cause traffic to slow to a speed that would impact circulation.

A wide array of traffic calming measures were discussed with the City and the committee that included some of the following measures:

BULBOUTS, also know as Pop-Outs and Curb Extensions, narrow the width of a street at intersection locations by extending the curb into the parking lanes. This creates a shorter crossing distance, decreasing a pedestrian's exposure time to oncoming vehicles. Bulbouts also may slow vehicles making right turns, as the potential turning radius is greatly reduced. By placing the pedestrian at the edge of the travel lane, both the pedestrian and driver have a better view of each other. The increased sidewalk area the bulb-out provides can be used for planters and landscaping to add aesthetic qualities. The minimum application includes bulbouts on two opposite corners at an intersection. There are many opportunities for bulb-outs along La Costa Avenue. Every signalized intersection could include bulb outs and help to provide for a consistent traffic calming effect throughout the corridor. Drainage concerns related to pop-outs can typically be handled through minor cross-slope adjustments of adjacent AC pavement, but may vary by location.



Enhanced crosswalk paving and bulb-out

MEDIAN ISLANDS provide an opportunity for landscaping and other visual enchancements that can help calm traffic by visually narrowing the perceived width of the roadway. The visual effect along with a potential to narrow the traffic lanes by providing for a median will help to reduce traffic speeds. Pedestrians may also use the median barrier as a refuge while crossing the street at intersections. Strategically placed median islands can also provide for an entry statement for a neighborhood. The entry or gateway statements can be enchanced landscaping, hardscape or signage. For La Costa Avenue, placing medians on the west side near El Camino Real and on the east side near Rancho Santa Fe Drive, will help reinforce the fact that this roadway traverses the neighborhood and help calm the traffic. Additional medians interspersed along the corridor, will also help reinforce the intent of the traffic calming in the neighborhood.

MID-BLOCK MEDIANS AND BULB-OUTS is a combination of traffic calming features that can provide both a visual as well as a physical element in the roadway that when implemented will help to reduce vehicle speeds. Along with these features, a narrowing of the travel lanes can be done to further provide for traffic calming. Narrowing travel lanes has been shown to be an effective tool to help regulate vehicle speeds. Drivers tend to drive more slowly when using a travel lane width of 11 feet versus a more typical 12 foot lane width. Although the effect is largely psychological, narrower travel lanes generally require more attention from drivers. By adding both bulb outs and medians with landscaping and other hardscape features, the driver experience is enchanced by having these features on both sides and furthering the opportunity for reduced speeds.

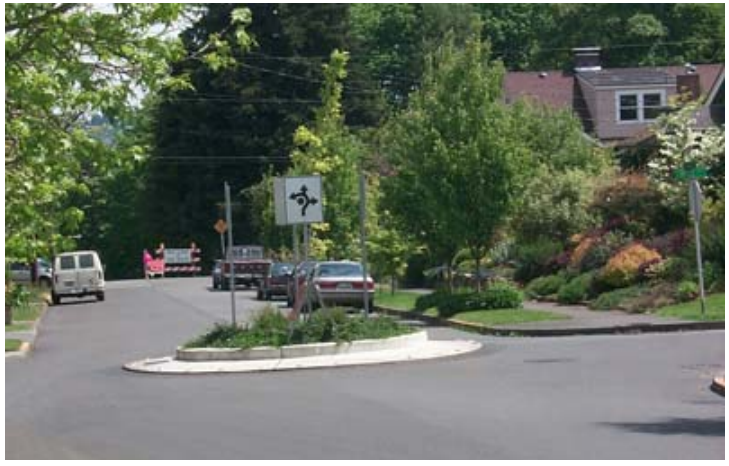
ROUNDABOUTS are considered to be the safest form of intersection traffic control, experiencing significantly fewer crashes (particularly injury crashes) than other types of intersections and are designed to regulate vehicle speeds depending on the size and characteristics of the roundabout. The City of Calrsbad has experience with implementing roundabouts and they are becoming more prevalent in the San Diego region. No traffic operational analysis was performed for this study, only a check of some of the constraints and it was found that there may be additional right-of-way that would be necessary on La Costa Avenue at the intersections where installed. Roundabouts would also provide visual focal points in the community.

MEDIANS WITH SIGNALIZED U-TURNS is a concept of traffic calming features near some of the intersections along La Costa Avenue. There are three locations where there are two intersections that are closely spaced where the implementation of the median would help to calm traffic. The effect of the median is to provide for another visual and physical enchancement that will add to the character of the neighborhood. The median would prevent some left-turn access from adjacent homes, but this can be accomodated at the next intersection as a u-turn. Some of the locations already have future traffic signals planned and these improvements would help mitigate the close proximity between nearby signals.

ENTRY TREATMENTS are typically used to symbolize a gateway into a community and to put the motorist into the frame of mind to drive slower through a residential neighborhood. This can be accomplished through the use of decorative pavement that marks the entrance to an area, prominent monumentation identifying the area, or thematic aesthetics that show a change in the environment that a driver has entered.

TRAFFIC CIRCLES are traffic calming measures typically placed at low-volume intersections. As part of the traffic calming improvements to La Costa Avenue, there may be neighborhood concerns over diversion to Levante Street. Although the Phase I road diet analysis did not show any diversion and increased traffic to Levante Street, traffic circles and a striped parking lane could be used to help reduce speeds along this residential collector roadway. Traffic circles direct traffic in a similar manner to roundabouts, but may have yield or stop-controlled approaches versus typical yielding conditions of a roundabout. The type of control used for the traffic circle should be closely examined before determining which intersections along a road segment would receive such a treatment. For example, if all-way stops were the preferred control of traffic circles, this treatment should only be done at the existing all-way stops or intersections that meet all-way stop warrants. However, if a yielding traffic circle is desired, the circle could be placed at subsequent secondary intersections between all-way stops. These secondary intersections currently have side-street stops would become all-way yield traffic circles, providing the most traffic calming impact. The traffic circles could be designed to be mountable for large vehicles, by making them dome-shaped with a maximum height of three inches. Alternatively, the traffic circles could be edged with standard curbs with added landscaping. In addition to the circles, striping a nine-foot wide parking lane along Levante Street would narrow the travel way. Because the street often has long sections of parking area that is not used, the stripe helps eliminate the appearance of a wider street by continuing the lane the length of the entire road.

The following pages show the traffic calming concepts that can be considered for La Costa Avenue and Levante Street.



BULB OUTS

PROS:

* LANDSCAPING / AESTHETICS
* PROTECT PARKING
* BENEFIT PEDESTRIAN CROSSINGS BY REDUCING CROSSING DISTANCE
* SLOW DOWN RIGHT-TURNS, ADDING TO PEDESTRIAN SAFETY

CONS:

* LOSS OF PARKING
* POTENTIAL TO LIMIT TRUCK TURNING AT SMALLER INTERSECTIONS

MEDIAN ISLANDS

PROS:

* LANDSCAPING OPPORTUNITIES
* PERCEPTION OF REDUCED LANE WIDTH
* WELL-PLACED, SMALLER MEDIANS WILL NOT AFFECT DRIVEWAY ACCESS

CONS:

* POTENTIALLY EXPENSIVE TO CONSTRUCT
* LARGER MEDIANS MAY RESTRICT LEFT-TURNS INTO SOME DRIVEWAYS
* GREATER MAINTENANCE NEEDS

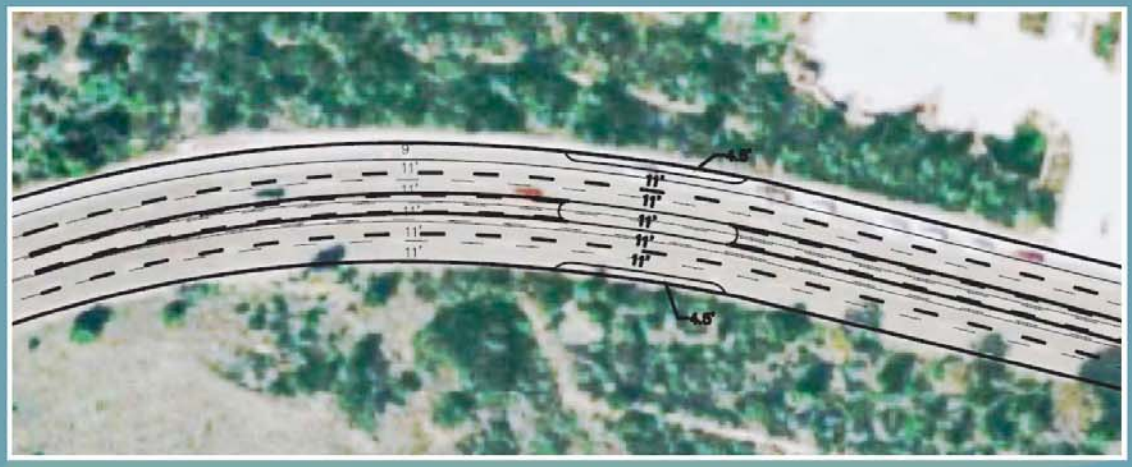
MID-BLOCK BULB-OUTS w/ MEDIANS

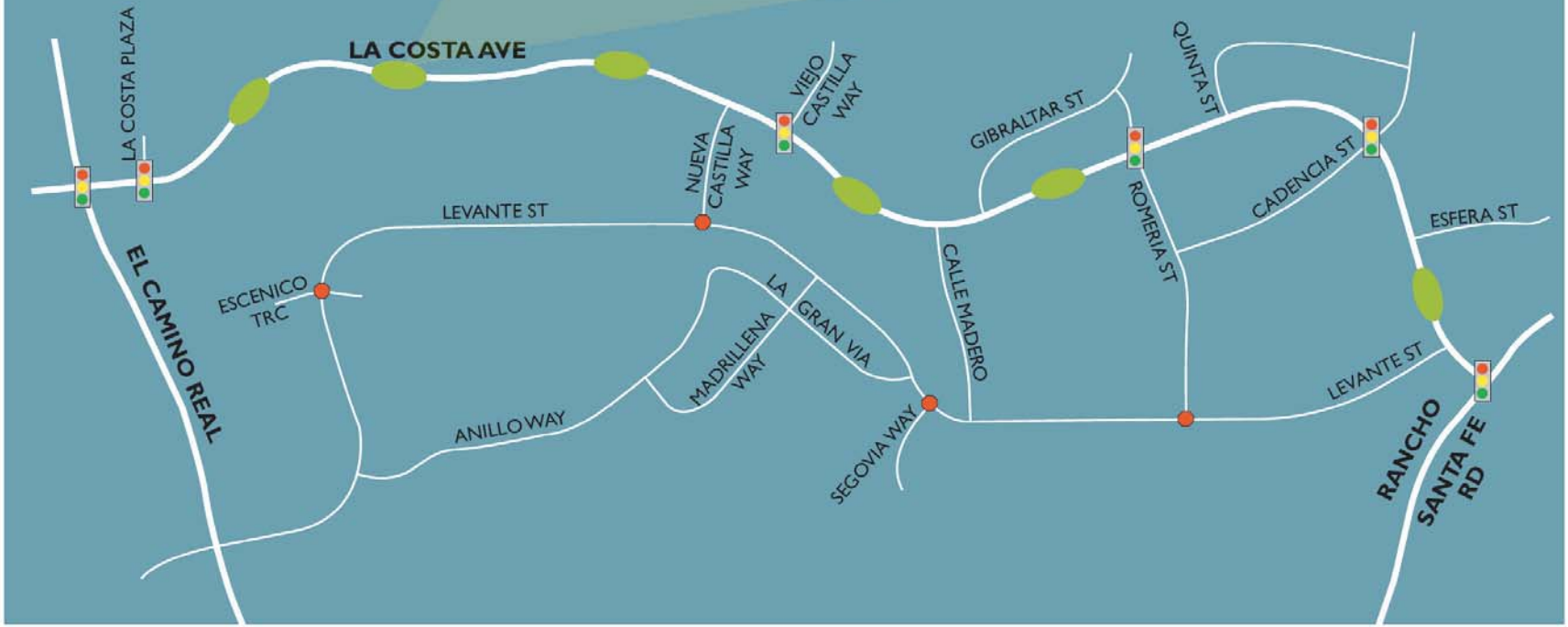
PROS:

* *BULB OUTS AND MEDIAN COMBINATION BRING ADDED EFFECT BY APPEARING TO NARROW THE ROAD FROM BOTH SIDES*
* *AESTHETIC TREATMENT THROUGH LANDSCAPING*

CONS:

* *LOSS OF PARKING*
* *LOCAL DRIVEWAY ACCESS RESTRICTED TO RIGHT TURNS*





MEDIANS w/ SIGNALIZED U-TURNS

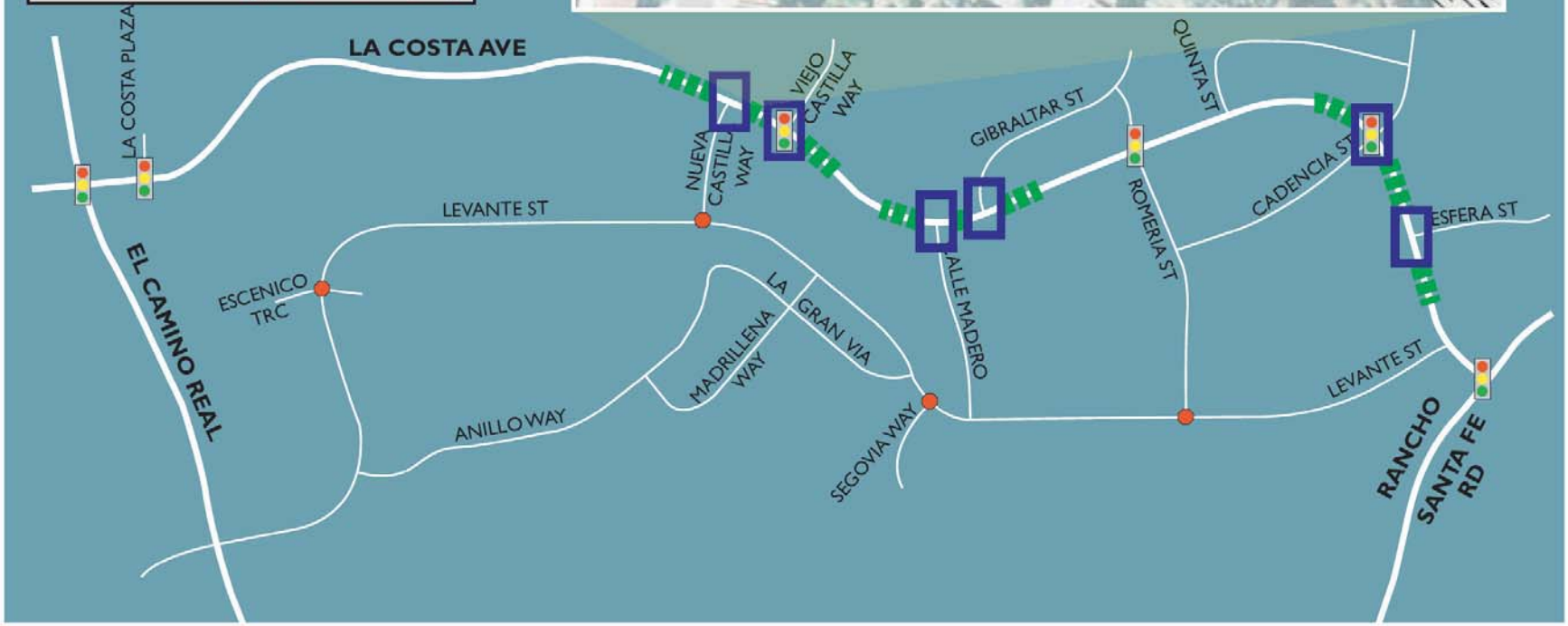
PROS:

* CONSPICUOUS, SUBSTANTIAL ELEMENT
* LANDSCAPING OPPORTUNITY
* MAINTAINS ACCESS TO ALL RESIDENTS BY ALLOWING U-TURNS AT NEAR INTERSECTION
* REDUCED TURNING CONFLICTS

CONS:

* U-TURNS DESIGNED FOR SMALLER VEHICLES, DIFFICULT FOR TRUCKS, ETC.

COST RANGE:
MEDIAN [$300 - $500 / FT]
SIGNAL UPGRADE [$50,000 - $190,000]



ROUNDABOUTS

PROS:

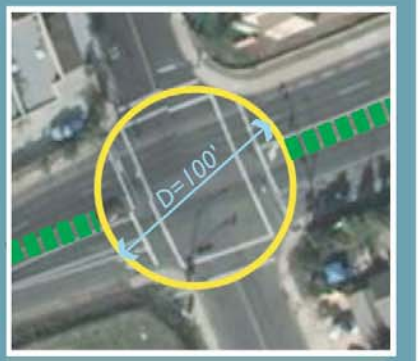
* ONE LANE, DIAMETER=100'
* CAPACITY ~20,000 AVE. DAILY TRAFFIC
* CAN COMBINE WITH MEDIANS
* WILL PROVIDE U-TURN MOVEMENTS
* SLOWS TRAFFIC TO <30MPH
* LESS SEVERE ACCIDENTS

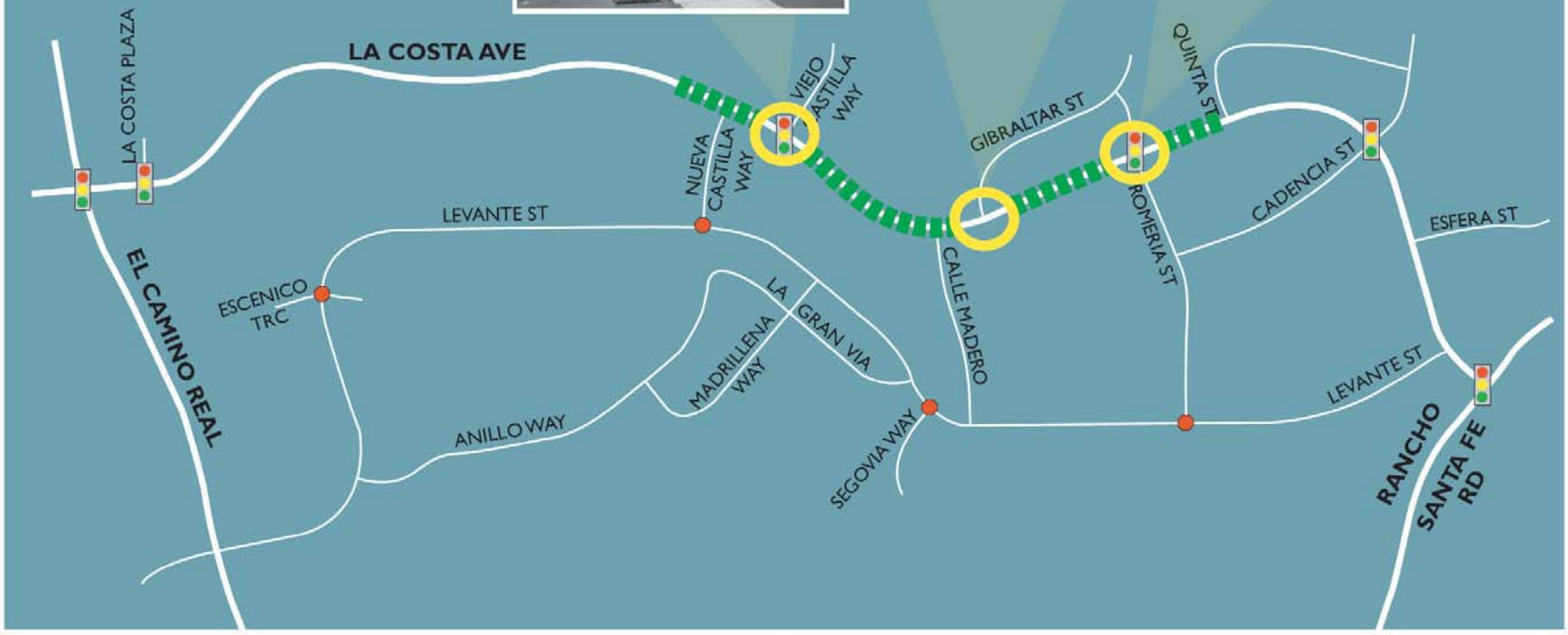
CONS:

* R/W NEEDED
* PROXIMITY TO SIGNALS <700'
* MERGE TO ONE LANE BEFORE ENTERING
* ONLY CONSIDERED WHERE NO DRIVEWAY CONFLICTS EXISTED

COST RANGE:

[$500,000 - $2,000,000]





TRAFFIC CIRCLES

PROS:

* POSITIVE HORIZONTAL DEFLECTION REDUCES SPEEDS AT INTERSECTIONS
* 3" HIGH MAX; MOUNTABLE FOR LARGE VEHICLES TURNS IF NEEDED
* CAN BE LANDSCAPED IF MADE PARTIALLY NON- MOUNTABLE
* LOW COST

CONS:

* VEHICLES MAY TRY TO GO THE WRONG DIRECTION AROUND THE CIRCLE TO MAKE TURNS

COST RANGE:
[$5,000 - $15,000]

ENTRY TREATMENT

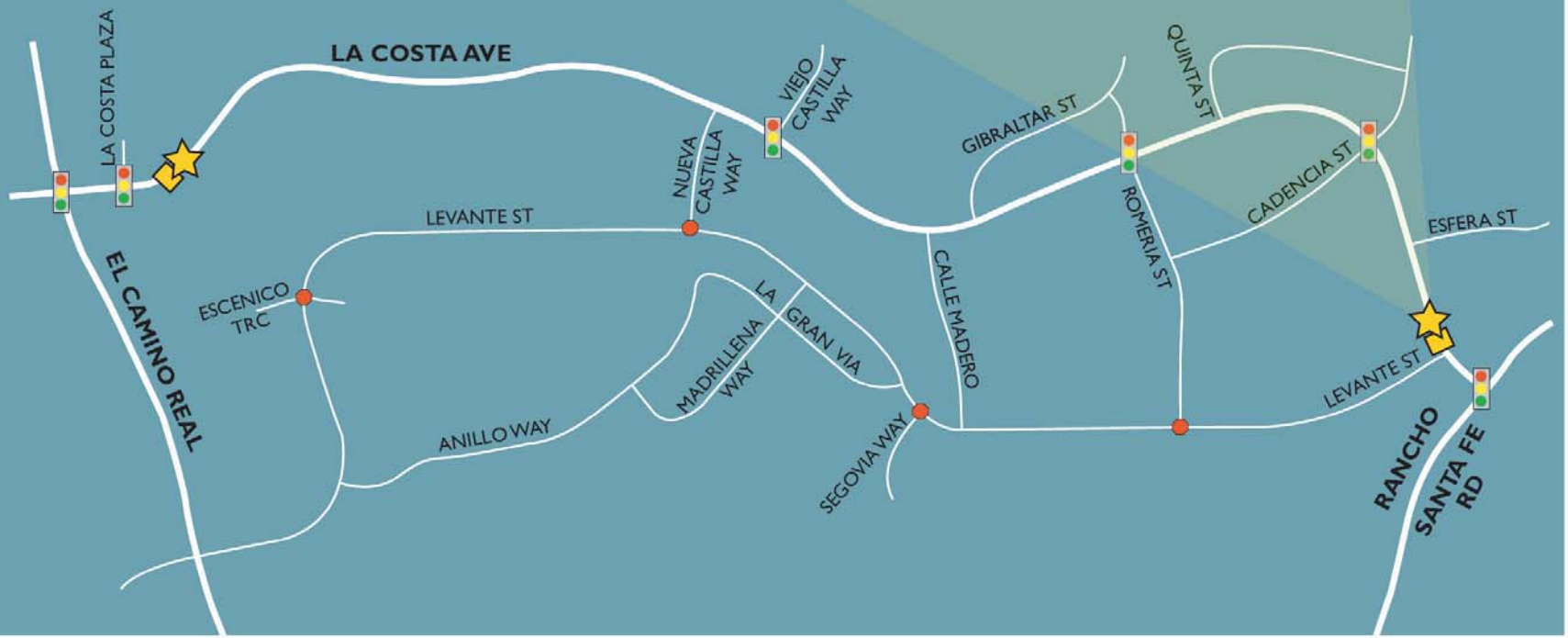
PROS:

* POTENTIAL SPEED REDUCTION
* SENSE OF NEIGHBORHOOD IDENTITY INSTEAD OF ARTERIAL THROUGHWAY
* AESTHETICALLY APPEALING

CONS:

* DOES NOT AFFECT ALL VEHICLES; VOLUNTARY COMPLIANCE
* WIDE RANGE OF COSTS; MAY NOT BE COST EFFECTIVE
* TEXTURED PAVEMENT CREATES NOISE FOR NEARBY RESIDENTS

COST RANGE:
[$15,000 - $150,000]



OTHER CONSIDERED TREATMENTS

ENHANCED CROSSWALKS OR INTERSECTIONS

PROS:
* EASILY SEEN, AESTHIC TREATMENT
* PEDESTRIAN ENHANCEMENT

CONS:
* EXPENSIVE, MAINTENANCE REQUIRED
* SOME NOISE CREATED

COST RANGE:
[$25,000 - $75,000 / CORNER]

REDUCE LANE WIDTHS

PROS:
* STRIPING IS LOW COST
* REDUCED LANE SIZE CREATE LESS ROOM FOR BICYCLISTS THAT DO NOT HAVE A DEDICATED BIKE LANE

CONS:
* NARROWER LANES MAY NOT BE CONDUCIVE TO LARGER VEHICLES

COST RANGE:
[$15 - 25 / FT OF RESTRIPING]

COLORED MEDIAN

PROS:
* CATCHES DRIVER ATTENTION FOR PERCEIVED REDUCTION IN ROAD WIDTH
* INEXPENSIVE TO PAINT
* EXPENSIVE TO CREATE COLOR PAVED SURFACE

CONS:
* PAINT NEEDS REGULAR MAINTENANCE

COST RANGE:
[$20 - $140 / LINEAL FOOT]

CHAPTER 3

COST ESTIMATES

PLANNING ESTIMATES

Planning level cost estimates were developed for each of the traffic calming concepts that were presented. Since no engineering or detailed design was completed at this phase, only conceptual details were used to prepare the estimates. Although some locations may benefit from a combination of the traffic control measures, the cost estimates separated the individual components as described in the previous chapter. The following are estimated planning level costs for each of the concepts. The cost estimates also include estimates for design costs as well as construction costs.

BULB-OUTS

A cost estimate was prepared for each intersection.

Typical La Costa Avenue intersection

Table 1A | Bulb-Outs Cost Estimate (1-3)

Item	Description	Qty.	Unit	Unit Price	Amount
La Costa Ave / Nueva Castilla Way					
1	Hardscape Removal	1,970	SF	$10	$19,700
2	AC Pavement Repair	420	SF	$12	$5,040
3	6" Curb & Gutter	210	LF	$25	$5,250
4	Curb Ramps	4	EA	$2,500	$10,000
5	4" PCC Sidewalk	1,200	SF	$8	$9,600
6	Landscaping	350	SF	$20	$7,000
7	Mobilization	1	LS	3%	$1,700
8	Traffic Control	1	LS	5%	$2,800
9	Contingency	1	LS	25%	$14,100
	La Costa Ave / Nueva Castilla Way Subtotal				$75,190
	Construction Management and Inspection	1	LS	15%	$11,300
	Design	1	LS	12%	$9,000
	La Costa Ave / Nueva Castilla Way Total				$95,490
La Costa Ave / Viejo Castilla Way					
1	Hardscape Removal	2,140	SF	$10	$21,400
2	AC Pavement Repair	440	SF	$12	$5,280
3	6" Curb & Gutter	220	LF	$25	$5,500
4	Curb Ramps	4	EA	$2,500	$10,000
5	4" PCC Sidewalk	1,600	SF	$8	$12,800
6	Landscaping	100	SF	$20	$2,000
7	Traffic Signal Modification	1	LS	$50,000	$50,000
8	Mobilization	1	LS	3%	$3,200
9	Traffic Control	1	LS	5%	$5,300
10	Contingency	1	LS	25%	$26,700
	La Costa Ave / Viejo Castilla Way Subtotal				$142,180
	Construction Management and Inspection	1	LS	15%	$21,300
	Design	1	LS	12%	$17,100
	La Costa Ave / Viejo Castilla Way Total				$180,580
La Costa Ave / Calle Madero					
1	Hardscape Removal	1,970	SF	$10	$19,700
2	AC Pavement Repair	420	SF	$12	$5,040
3	6" Curb & Gutter	210	LF	$25	$5,250
4	Curb Ramps	4	EA	$2,500	$10,000
5	4" PCC Sidewalk	1,200	SF	$8	$9,600
6	Landscaping	350	SF	$20	$7,000
7	Mobilization	1	LS	3%	$1,700
8	Traffic Control	1	LS	5%	$2,800
9	Contingency	1	LS	25%	$14,100
	La Costa Ave / Calle Madero Subtotal				$75,190
	Construction Management and Inspection	1	LS	15%	$11,300
	Design	1	LS	12%	$9,000
	La Costa Ave / Calle Madero Total				$95,490

Table 1B | Bulb-Outs Cost Estimate (4-8)

Item	Description	Qty.	Unit	Unit Price	Amount
La Costa Ave / Gibraltar St					
1	Hardscape Removal	2,660	SF	$10	$26,600
2	AC Pavement Repair	460	SF	$12	$5,520
3	6" Curb & Gutter	230	LF	$25	$5,750
4	Curb Ramps	2	EA	$2,500	$5,000
5	4" PCC Sidewalk	2,000	SF	$8	$16,000
6	Landscaping	200	SF	$20	$4,000
7	Mobilization	1	LS	3%	$1,900
8	Traffic Control	1	LS	5%	$3,100
9	Contingency	1	LS	25%	$15,700
	La Costa Ave / Gibraltar St Subtotal				$83,570
	Construction Management and Inspection	1	LS	15%	$12,500
	Design	1	LS	12%	$10,000
	La Costa Ave / Gibraltar St Total				$106,070
La Costa Ave / Romeria St					
1	Hardscape Removal	2,360	SF	$10	$23,600
2	AC Pavement Repair	560	SF	$12	$6,720
3	6" Curb & Gutter	280	LF	$25	$7,000
4	Curb Ramps	8	EA	$2,500	$20,000
5	4" PCC Sidewalk	1,600	SF	$8	$12,800
6	Landscaping	200	SF	$20	$4,000
7	Traffic Signal Modification	1	LS	$50,000	$50,000
8	Mobilization	1	LS	3%	$3,700
9	Traffic Control	1	LS	5%	$6,200
10	Contingency	1	LS	25%	$31,000
	La Costa Ave / Romeria St Subtotal				$165,020
	Construction Management and Inspection	1	LS	15%	$24,800
	Design	1	LS	12%	$19,800
	#VALUE!				$209,620
La Costa Ave / Quinta St					
1	Hardscape Removal	1,180	SF	$10	$11,800
2	AC Pavement Repair	280	SF	$12	$3,360
3	6" Curb & Gutter	140	LF	$25	$3,500
4	Curb Ramps	4	EA	$2,500	$10,000
5	4" PCC Sidewalk	800	SF	$8	$6,400
6	Landscaping	100	SF	$20	$2,000
7	Mobilization	1	LS	3%	$1,100
8	Traffic Control	1	LS	5%	$1,900
9	Contingency	1	LS	25%	$9,300
	La Costa Ave / Quinta St Subtotal				$49,360
	Construction Management and Inspection	1	LS	15%	$7,400
	Design	1	LS	12%	$5,900
	La Costa Ave / Quinta St Total				$62,660

Item	Description	Qty.	Unit	Unit Price	Amount
La Costa Ave / Cadencia St					
1	Hardscape Removal	2,840	SF	$10	$28,400
2	AC Pavement Repair	640	SF	$12	$7,680
3	6" Curb & Gutter	320	LF	$25	$8,000
4	Curb Ramps	8	EA	$2,500	$20,000
5	4" PCC Sidewalk	2,000	SF	$8	$16,000
6	Landscaping	200	SF	$20	$4,000
7	Traffic Signal Modification	1	LS	$100,000	$100,000
8	Mobilization	1	LS	3%	$5,500
9	Traffic Control	1	LS	5%	$9,200
10	Contingency	1	LS	25%	$46,000
	La Costa Ave / Cadencia St Subtotal				$244,780
	Construction Management and Inspection	1	LS	15%	$36,700
	Design	1	LS	12%	$29,400
	La Costa Ave / Cadencia St Total				$310,880
La Costa Ave / Esfera St					
1	Hardscape Removal	1,180	SF	$10	$11,800
2	AC Pavement Repair	280	SF	$12	$3,360
3	6" Curb & Gutter	140	LF	$25	$3,500
4	Curb Ramps	4	EA	$2,500	$10,000
5	4" PCC Sidewalk	800	SF	$8	$6,400
6	Landscaping	100	SF	$20	$2,000
7	Mobilization	1	LS	3%	$1,100
8	Traffic Control	1	LS	5%	$1,900
9	Contingency	1	LS	25%	$9,300
	La Costa Ave / Esfera St Subtotal				$49,360
	Construction Management and Inspection	1	LS	15%	$7,400
	Design	1	LS	12%	$5,900
	La Costa Ave / Esfera St Total				$62,660
	Project Total				$1,123,450

MEDIANS

The cost for median construction will be based on the desired length of the median for the project. Therefore, a unit cost per linear foot was provided.

MID-BLOCK BULB-OUTS WITH MEDIANS

A cost estimate was developed for one conceptual location. This traffic calming measure should be implemented consistently throughout the corridor to have the greatest effect on traffic calming. Some locations may also require driveway reconstruction or modifications. The subsequent cost to implement this would be multiplied by the number of specific locations that were selected for this treatment. Ideally a minimum of six locations should be considered for this treatment.

Typical mid-block bulb-outs with median

Table 2 | Median Cost Estimate

Item	Description	Qty.	Unit	Unit Price	Amount
La Costa Ave (Unit Cost per LF)					
1	Hardscape Removal	14	SF	$10	$140
2	AC Pavement Repair	3	SF	$12	$36
3	6" Curb & Gutter	2	LF	$25	$50
4	4" PCC Median Maintenance Strip	3	SF	$8	$24
5	Landscaping	10	SF	$20	$200
6	Mobilization	1	LS	3%	$10
7	Traffic Control	1	LS	5%	$20
8	Contingency	1	LS	25%	$100
	La Costa Ave (Unit Cost per LF) Subtotal				$580
	Construction Management and Inspection	1	LS	15%	$100
	Design	1	LS	12%	$100
	La Costa Ave (Unit Cost per LF) Total				$780
	Project Total (Unit Cost / LF)				$780

Table 3 | Mid-Block Bulb-Outs with Medians Cost Estimate

Item	Description	Qty.	Unit	Unit Price	Amount
La Costa Ave (1 of 6 Locations)					
1	Hardscape Removal	3,080	SF	$10	$30,800
2	AC Pavement Repair	880	SF	$12	$10,560
3	6" Curb & Gutter	440	LF	$25	$11,000
4	4" PCC Sidewalk	1,000	SF	$8	$8,000
5	Landscaping	1200	SF	$20	$24,000
6	Mobilization	1	LS	3%	$2,500
7	Traffic Control	1	LS	5%	$4,200
8	Contingency	1	LS	25%	$21,100
	La Costa Ave (1 of 6 Locations) Subtotal				$112,160
	Construction Management and Inspection	1	LS	15%	$16,800
	Design	1	LS	12%	$13,500
	La Costa Ave (1 of 6 Locations) Subtotal				$142,460
	Number of Locations				6
	Project Total				$854,760

Table 4 | Median with Signalized U-Turns Cost Estimate

Item	Description	Qty.	Unit	Unit Price	Amount
La Costa Ave from w/o Nueva Castilla Way to e/o Viejo Castilla Way					
1	Hardscape Removal	6,380	SF	$10	$63,800
2	AC Pavement Repair	2,380	SF	$12	$28,560
3	6" Curb & Gutter	1,190	LF	$25	$29,750
4	4" PCC Sidewalk	2,800	SF	$8	$22,400
5	Landscaping	1200	SF	$20	$24,000
6	Traffic Signals (1 New, 1 Modification)	1	LS	$240,000	$240,000
7	Mobilization	1	LS	3%	$12,300
8	Traffic Control	1	LS	5%	$20,400
9	Contingency	1	LS	25%	$102,100
	La Costa Ave from w/o Nueva Castilla Way to e/o Viejo Castilla Way Subtotal				$543,310
	Construction Management and Inspection	1	LS	15%	$81,500
	Design	1	LS	12%	$65,200
	La Costa Ave from w/o Nueva Castilla Way to e/o Viejo Castilla Way Total				$690,010
La Costa Ave from w/o Calle Madero to e/o Gibraltar St					
1	Hardscape Removal	5,280	SF	$10	$52,800
2	AC Pavement Repair	1,880	SF	$12	$22,560
3	6" Curb & Gutter	940	LF	$25	$23,500
4	4" PCC Sidewalk	2,600	SF	$8	$20,800
5	Landscaping	800	SF	$20	$16,000
6	Traffic Signals (2 New)	1	LS	$380,000	$380,000
7	Mobilization	1	LS	3%	$15,500
8	Traffic Control	1	LS	5%	$25,800
9	Contingency	1	LS	25%	$128,900
	La Costa Ave from w/o Calle Madero to e/o Gibraltar St Subtotal				$685,860
	Construction Management and Inspection	1	LS	15%	$102,900
	Design	1	LS	12%	$82,300
	La Costa Ave from w/o Calle Madero to e/o Gibraltar St Total				$871,060
La Costa Ave from w/o Cadencia St to e/o Esfera St					
1	Hardscape Removal	9,880	SF	$10	$98,800
2	AC Pavement Repair	3,680	SF	$12	$44,160
3	6" Curb & Gutter	1,840	LF	$25	$46,000
4	4" PCC Sidewalk	3,400	SF	$8	$27,200
5	Landscaping	2800	SF	$20	$56,000
6	Traffic Signals (1 New, 1 Modification)	1	LS	$290,000	$290,000
7	Mobilization	1	LS	3%	$16,900
8	Traffic Control	1	LS	5%	$28,100
9	Contingency	1	LS	25%	$140,500
	La Costa Ave from w/o Cadencia St to e/o Esfera St Subtotal				$747,660
	Construction Management and Inspection	1	LS	15%	$112,100
	Design	1	LS	12%	$89,700
	La Costa Ave from w/o Cadencia St to e/o Esfera St Total				$949,460
	Project Total				$2,510,530

MEDIANS WITH SIGNALIZED U-TURNS

A cost estimate was developed for each of the three locations where this treatment would be implemented. Although the City has future plans to install traffic signals at four intersections along La Costa Avenue, the cost to construct new traffic signals was included in these costs.

ROUNDABOUTS

Three roundabouts were estimated at a planning level, based on an approximate diameter of 100 feet for each. Two of the roundabouts have a three-legged approach configuration and the last intersection has four legs. Medians that might extend from the roundabouts were not included in the costs. Right-of-way will likely be required for at least two of the roundabouts, but was also not included in these costs. The amount of right-of-way will be determined by grading and ultimate use of retaining walls if necessary.

Table 5 | Roundabouts Cost Estimate

Item	Description	Qty.	Unit	Unit Price	Amount
La Costa Ave / Viejo Castilla Way (3 Legs)					
1	Hardscape Removal	20,500	SF	$10	$205,000
2	AC Pavement Repair	11,000	SF	$12	$132,000
3	6" Curb & Gutter	1,000	LF	$25	$25,000
4	Curb Ramps	6	EA	$2,500	$15,000
5	4" PCC Sidewalk	5,100	SF	$8	$40,800
6	Concrete Apron	1,300	SF	$10	$13,000
7	Landscaping	3550	SF	$20	$71,000
8	Lighting	1	LS	$24,000	$24,000
9	Grading	1	LS	$30,000	$30,000
10	Retaining Walls	1	LS	$60,000	$60,000
11	Mobilization	1	LS	3%	$18,500
12	Traffic Control	1	LS	5%	$30,800
13	Contingency	1	LS	25%	$154,000
	La Costa Ave / Viejo Castilla Way (3 Legs) Subtotal				**$819,100**
	Construction Management and Inspection	1	LS	15%	$122,900
	Design	1	LS	12%	$98,300
	La Costa Ave / Viejo Castilla Way (3 Legs) Total				**$1,040,300**
La Costa Ave / Gibraltar St (3 Legs)					
1	Hardscape Removal	20,500	SF	$10	$205,000
2	AC Pavement Repair	11,000	SF	$12	$132,000
3	6" Curb & Gutter	1,000	LF	$25	$25,000
4	Curb Ramps	6	EA	$2,500	$15,000
5	4" PCC Sidewalk	5,100	SF	$8	$40,800
6	Concrete Apron	1,300	SF	$10	$13,000
7	Landscaping	3550	SF	$20	$71,000
8	Lighting	1	LS	$24,000	$24,000
9	Grading	1	LS	$45,000	$45,000
10	Retaining Walls	1	LS	$120,000	$120,000
11	Mobilization	1	LS	3%	$18,500
12	Traffic Control	1	LS	5%	$30,800
13	Contingency	1	LS	25%	$154,000
	La Costa Ave / Gibraltar St (3 Legs) Subtotal				**$894,100**
	Construction Management and Inspection	1	LS	15%	$134,100
	Design	1	LS	12%	$107,300
	La Costa Ave / Gibraltar St (3 Legs) Total				**$1,135,500**

Item	Description	Qty.	Unit	Unit Price	Amount
La Costa Ave / Romeria St (4 Legs)					
1	Hardscape Removal	25,000	SF	$10	$250,000
2	AC Pavement Repair	15,000	SF	$12	$180,000
3	6" Curb & Gutter	1,200	LF	$25	$30,000
4	Curb Ramps	8	EA	$2,500	$20,000
5	4" PCC Sidewalk	5,500	SF	$8	$44,000
6	Concrete Apron	1,300	SF	$10	$13,000
7	Landscaping	3800	SF	$20	$76,000
8	Lighting	1	LS	$32,000	$32,000
9	Grading	1	LS	$15,000	$15,000
10	Mobilization	1	LS	3%	$18,500
11	Traffic Control	1	LS	5%	$30,800
12	Contingency	1	LS	25%	$154,000
	La Costa Ave / Romeria St (4 Legs) Subtotal				**$863,300**
	Construction Management and Inspection	1	LS	15%	$129,500
	Design	1	LS	12%	$103,600
	La Costa Ave / Romeria St (4 Legs) Total				**$1,096,400**
	Project Total				**$3,272,200**

Table 6 | Traffic Circles Cost Estimate

Item	Description	Qty.	Unit	Unit Price	Amount
La Costa Ave (Per Location)					
1	Hardscape Removal	220	SF	$10	$2,200
2	AC Pavement Repair	80	SF	$12	$960
3	Concrete Apron	80	SF	$10	$800
4	Landscaping	60	SF	$25	$1,500
4	Mobilization	1	LS	3%	$200
5	Traffic Control	1	LS	5%	$300
6	Contingency	1	LS	25%	$1,400
				La Costa Ave (Per Location) Subtotal	$7,360
	Construction Management and Inspection	1	LS	15%	$1,100
	Design	1	LS	12%	$900
				La Costa Ave (Per Location) Total	$9,360
				Project Total (Unit Cost / Location)	$9,360

Table 7 | Entry Treatments Cost Estimate

Item	Description	Qty.	Unit	Unit Price	Amount
La Costa Ave (Per Location)					
1	Hardscape Removal	1,800	SF	$10	$18,000
2	AC Pavement Repair	300	SF	$12	$3,600
3	6" Curb & Gutter	60	LF	$25	$1,500
4	4" PCC Median Maintenance Strip	90	SF	$8	$720
5	Landscaping	250	SF	$20	$5,000
6	Decorative Concrete	1,500	SF	$25	$37,500
7	Monument Sign	1	EA	$20,000	$20,000
8	Mobilization	1	LS	3%	$2,600
9	Traffic Control	1	LS	5%	$4,300
10	Contingency	1	LS	25%	$21,600
				La Costa Ave (Per Location) Subtotal	$114,820
	Construction Management and Inspection	1	LS	15%	$17,200
	Design	1	LS	12%	$13,800
				La Costa Ave (Per Location) Total	$145,820
				Project Total (Unit Cost / Location)	$145,820

Table 8 | Enhanced Crosswalks Cost Estimate

Item	Description	Qty.	Unit	Unit Price	Amount
La Costa Ave (Per Linear Foot)					
1	Hardscape Removal	15	SF	$10	$150
2	AC Pavement Repair	5	SF	$12	$60
3	Decorative Concrete	10	SF	$25	$250
4	Mobilization	1	LS	3%	$0
5	Traffic Control	1	LS	5%	$0
6	Contingency	1	LS	25%	$100
				La Costa Ave (Per Linear Foot) Subtotal	$560
	Construction Management and Inspection	1	LS	15%	$100
	Design	1	LS	12%	$100
				La Costa Ave (Per Linear Foot) Total	$760
				Project Total (Unit Cost / LF)	$760

TRAFFIC CIRCLES

Traffic circles were estimated per location, depending how many would be considered for this treatment. The estimate assumes a 10-foot diameter circle and landscaping, although landscaping could be omitted to reduce costs. Striping for the parking lane was also not included, but would cost approximately $10,000 to complete the entire length of Levante Street.

ENTRY TREATMENTS

The cost estimates for an entry treatment assumes a 25-foot long section of decorative concrete the entire width of the road with a monument sign mounted in a proposed median. The costs will vary based on budget and size of the entry/gateway desired.

ENHANCED CROSSWALKS

Costs for an enhanced crosswalk will vary depending on the length of each crosswalk improved. The cost estimate reflects a unit cost per linear foot of crosswalk with decorative concrete pavement. No curb ramp upgrades were included in these costs. La Costa Avenue is 64' wide and including two 8' bulb-outs a typical crosswalk may be approximately 48' long.

CHAPTER 4

CONCLUSION

To alleviate the concerns of residents that live along La Costa Avenue, implementation of traffic calming measures would be a benefit. This report has outlined some opportunities for traffic calming that can be considered at different locations along La Costa Avenue. Detailed design would be required, however, to determine the most feasible solution.

The project team met with the City and neighborhood committee to discuss the traffic calming concepts for La Costa Avenue and all the concepts were well received. Based on that input, cost estimates were prepared. Concepts developed to date will be presented for review by the City Council and determination of the next steps. The next steps could be for a more detailed conceptual design to be prepared as part of a Phase III to this project. This design would be specific in the location and application of the various combinations of traffic control measures and would constitute a roughly 30% complete design. At that time, additional public meetings would be held to gather more input and direction on the traffic calming measures and draft plans would be produced to that more detailed cost estimates can be developed and funding sources can be outlined.

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